229981

What is claimed is:

1. A DNA fragment which encodes a polypeptide defined in the following (A) or (B):

(A) a polypeptide which has an amino acid sequence comprises at least the amino acid numbers 50 to 393 of the amino acid sequence of SEQ ID NO: 2,

(B) a polypeptide which has an amino acid sequence comprises at least the amino acid numbers 50 to 393 of the amino acid sequence of SEQ ID NO: 2 including substitution, deletion, insertion, addition, or inversion of one or several amino acids, and can constitute a protein having a carbamoyl-phosphate synthetase activity with a large subunit of carbamoyl-phosphate synthetase comprising the amino acid sequence of SEQ ID NO: 3.

2. A DNA fragment which encodes a polypeptide defined in the following (C) or (D):

(C) a polypeptide which comprises the amino acid sequence of SEQ ID NO: 3,

(D) a polypeptide which comprises the amino acid sequence of SEQ ID NO: 3 including substitution, deletion, insertion, addition, or inversion of one or several amino acids, and can constitute a protein having a carbamoyl-phosphate synthetase activity with a small subunit of carbamoyl-phosphate synthetase having an amino acid sequence comprises at least the amino acid numbers 50 to 393 of the amino acid sequence of SEQ ID

NO: 2.

3. A DNA fragment encoding a polypeptide which comprises the amino acid sequence of SEQ ID NO: 3 including substitution, deletion, insertion, addition, or inversion of one or several amino acids, and can constitute a protein having a carbamoyl-phosphate synthetase activity.

4. A DNA fragment which encodes a polypeptide defined in the following (a) or (b), and a polypeptide defined in the following (c) or (d):

(a) a polypeptide which has an amino acid sequence comprising at least the amino acid numbers 50 to 393 in SEQ ID NO: 2,

(b) a polypeptide which has an amino acid sequence comprising at least the amino acid numbers 50 to 393 in SEQ ID NO: 2 including substitution, deletion, insertion, addition, or inversion of one or several amino acids, and can constitute a protein having a carbamoyl-phosphate synthetase activity with a large subunit of carbamoyl-phosphate synthetase comprising the amino acid sequence of SEQ ID NO: 3,

(c) a polypeptide which comprises the amino acid sequence of SEQ ID NO: 3,

(d) a polypeptide which comprises the amino acid sequence of SEQ ID NO: 3 including substitution, deletion, insertion, addition, or inversion of one or several amino acids, and can constitute a protein having

a carbamoyl-phosphate synthetase activity with a small subunit of carbamoyl-phosphate synthetase having an amino acid sequence comprising the amino acid numbers 50 to 393 in SEQ ID NO: 2.

5. The DNA fragment according to claim 1, which has a nucleotide sequence comprising at least the nucleotide numbers 430 to 1461 in the nucleotide sequence of SEQ ID NO: 1.

6. The DNA fragment according to claim 2, which has a nucleotide sequence comprising at least the nucleotide numbers 1756 to 4809 in the nucleotide sequence of SEQ ID NO: 1.

7. The DNA fragment according to claim 3, which has a nucleotide sequence comprising at least the nucleotide numbers 430 to 4809 in the nucleotide sequence of SEQ ID NO: 1.

8. A protein which comprises a polypeptide defined in the following (a) or (b), and a polypeptide defined in the following (c) or (d):

(a) a polypeptide which has an amino acid sequence comprising at least the amino acid numbers 50 to 393 in SEQ ID NO: 2,

(b) a polypeptide which has an amino acid sequence comprising at least the amino acid numbers 50 to 393 in SEQ ID NO: 2 including substitution, deletion, insertion, addition, or inversion of one or several amino acids, and can constitute a protein having a carbamoyl-

phosphate synthetase activity with a large subunit of carbamoyl-phosphate synthetase comprising the amino acid sequence of SEQ ID NO: 3,

(c) a polypeptide which comprises the amino acid sequence of SEQ ID NO: 3,

(d) a polypeptide which comprises the amino acid sequence of SEQ ID NO: 3 including substitution, deletion, insertion, addition, or inversion of one or several amino acids, and can constitute a protein having a carbamoyl-phosphate synthetase activity with a small subunit of carbamoyl-phosphate synthetase having an amino acid sequence comprising at least the amino acid numbers 50 to 393 in SEQ ID NO: 2.

9. A coryneform bacterium which is transformed with a DNA fragment according to any one of claims 1 to 7.

10. A microorganism which has enhanced intracellular carbamoyl-phosphate synthetase activity, and has L-arginine productivity.

11. The microorganism according to claim 10, wherein the enhanced intracellular carbamoyl-phosphate synthetase activity is obtained by increasing copy number of DNA encoding carbamoyl-phosphate synthetase of the microorganism, or by modifying an expression regulation sequence so that expression of the gene encoding carbamoyl-phosphate synthetase in the cell should be enhanced.

12. The microorganism according to claim 11, wherein the DNA is a DNA fragment according to any one of claims 1 to 7.

13. The microorganism according to claim 12, which is a coryneform bacterium.

14. A method for producing of L-arginine, comprising the steps of culturing a coryneform bacterium according to any one of claims 10 to 13 in a medium to produce and accumulate L-arginine in the medium, and collecting the L-arginine from the medium.